



# ACHARYA INSTITUTE OF TECHNOLOGY

## Department of Mechanical Engineering

Bengaluru-560107

2019-20

1<sup>ST</sup> YEAR

DEPARTMENT	ME	SEMESTER	1	COURSE CODE	18EGDL15	COURSE ID	C105
COURSE TITLE		ENGINEERING GRAPHICS					
COURSE OUTCOME NO		COURSE OUTCOME STATEMENTS					
C105.1		Able to have the knowledge of different coordinate system and drafting software solid edge V19					
C105.2		Able to draw the orthographic projections of points, lines, planes, solids and isometric projections					
C105.3		Able to develop the lateral surfaces of prisms and pyramids					
C105.4							
C105.5							
DEPARTMENT	ME	SEMESTER	2	COURSE CODE	18ME25	COURSE ID	C115
COURSE TITLE		ELEMENTS OF MECHANICAL ENGINEERING					
COURSE OUTCOME NO		COURSE OUTCOME STATEMENTS					
C115.1		Able to gain knowledge on various energy resources, boilers, prime movers, robots & automation, refrigeration & air conditioner.					
C115.2		Able to understand different joining techniques, metal removal process, boilers, IC engines, refrigeration and air conditioner					
C115.3		Able to apply and use of various engineering materials, refrigeration & air conditioner and different machine tool operation.					
C115.4		Able to compare between 2 strokes and 4 stroke engines, welding process, machining operations and refrigeration system					
C115.5							



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2<sup>ND</sup> YEAR

DEPAR TMENT	M E	SEMESTER	3	COURSE CODE	18ME32	COURSE ID	C202
COURSE TITLE		Mechanics of Materials					
COURSE OUTCOME NO		COURSE OUTCOME STATEMENTS					
C202.1		Able to define Elastic Properties of Materials, Different types of stress due to application of loads and energy stored in various structural members.					
C202.2		Able to comprehend the relation for stress and strain distribution, Shear force and Bending moment diagram, Torque and stability of columns from failure theories					
C202.3		Able to apply the known and comprehended concepts and to calculate the stresses, strains and strain energy in Bars, Cylinders, Beams, Shafts, and Columns.					
C202.4		Able to analyze the stresses and strains for plane stress condition analytically and graphically for structural members and analyze stress distribution for thick and thin cylinders.					
C202.5							
DEPAR TMENT	M E	SEMESTER	3	COURSE CODE	18ME33	COURSE ID	C203
COURSE TITLE		Basic Thermodynamics					
COURSE OUTCOME NO		COURSE OUTCOME STATEMENTS					
C203.1		Able to learn about the fundamentals of energy interactions, laws of thermodynamics along with various processes involved and properties.					
C203.2		Able to understand and obtain the relationship between different temperature scale, energy and its property.					
C203.3		Able to apply conservation of energy, the laws of thermodynamics in various systems.					
C203.4							
C203.5							
DEPAR TMENT	M E	SEMESTER	3	COURSE CODE	18ME34	COURSE ID	C204
COURSE TITLE		Material Science					
COURSE OUTCOME NO		COURSE OUTCOME STATEMENTS					



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<b>C204.1</b>		Able to understand the properties of engineering materials and their behavior					
<b>C204.2</b>		Able to describe the procedure of heat treatment and processing of composite materials					
<b>C204.3</b>		Able to understand the potentialities of various materials and material selection procedure					
<b>C204.4</b>							
<b>C204.5</b>							
<b>DEPAR TMENT</b>	<b>M E</b>	<b>SEMESTER</b>	<b>3</b>	<b>COURSE CODE</b>	<b>18ME35A</b>	<b>COURSE ID</b>	<b>C205</b>
<b>COURSE TITLE</b>		Metal cutting and forming					
<b>COURSE OUTCOME NO</b>		<b>COURSE OUTCOME STATEMENTS</b>					
<b>C205.1</b>		Describe various cutting tool materials, machine tools, machining processes and metal forming processes					
<b>C205.2</b>		Explain the mechanism of machining processes, cutting tool materials, tool nomenclature, tool wear, tool life and economics of machining processes and metal forming processes.					
<b>C205.3</b>		Estimate the effect of machining processes and parameters on surface finish, tool wear, tool life, machining efficiency and to estimate the effect of different forces acting on the dies during sheet metal operations.					
<b>C205.4</b>							
<b>C205.5</b>							
<b>DEPAR TMENT</b>	<b>M E</b>	<b>SEMESTER</b>	<b>3</b>	<b>COURSE CODE</b>	<b>18ME36A</b>	<b>COURSE ID</b>	<b>C206</b>
<b>COURSE TITLE</b>		COMPUTER AIDED MACHINE DRAWING					
<b>COURSE OUTCOME NO</b>		<b>COURSE OUTCOME STATEMENTS</b>					
<b>C206.1</b>		Able to draw orthographic projections and sectional views of standard primitives and Machine components.					
<b>C206.2</b>		Able to draw orthographic projections of standard thread forms, joints and couplings.					
<b>C206.3</b>		Able to create/model parts and assembly of machine components using Solid edge.					
<b>C206.4</b>							
<b>C206.5</b>							
<b>DEPAR TMENT</b>	<b>M E</b>	<b>SEMESTER</b>	<b>3</b>	<b>COURSE CODE</b>	<b>18MEL37A</b>	<b>COURSE ID</b>	<b>C207</b>
<b>COURSE TITLE</b>		MATERIAL TESTING LAB					



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COURSE OUTCOME NO		COURSE OUTCOME STATEMENTS						
C207.1		Able to gain knowledge to conduct material tests to find different material properties. Also to gain knowledge about the heat treatment processes and non-destructive tests.						
C207.2		Able to understand and demonstrate different microstructures of the material.						
C207.3		Able to implement different strength and characteristic tests of a material depending on the application.						
C207.4								
C207.5								
DEPAR TMENT	M E	SEMESTER	3	COURSE CODE	18MEL38A	COURSE ID	C208	
COURSE TITLE		Workshop and Machine Shop Practice						
COURSE OUTCOME NO		COURSE OUTCOME STATEMENTS						
C208.1		Able to describe various machine tools, machining processes, mechanics of machining and cutting tool materials.						
C208.2		Able to explain the mechanism of machining processes, cutting tool materials, tool nomenclature, tool wear, tool life and economics of machining processes						
C208.3		Able to estimate the effect of machining processes and parameters on surface finish, tool wear, tool life and machining efficiency.						
C208.4								
C208.5								

DEPARTMENT	ME	SEMESTER	4	COURSE CODE	18ME42	COURSE ID	C212
COURSE TITLE		Applied Thermodynamics					
COURSE OUTCOME NO		COURSE OUTCOME STATEMENTS					
C212.1		Able to outline the Gas power cycles, vapour power cycles and know how fuel burns and their thermodynamic properties.					
C212.2		Able to explain the performance and mechanisms of gas power cycle, steam power cycle and refrigeration system					



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<b>C212.3</b>		Able to compute the performance of gas power plant, steam power plant, IC Engine, Reciprocating compressors and refrigeration system.					
<b>C212.4</b>							
<b>C212.5</b>							
<b>DEPARTMENT</b>	<b>ME</b>	<b>SEMESTER</b>	<b>4</b>	<b>COURSE CODE</b>	<b>18ME43</b>	<b>COURSE ID</b>	<b>C213</b>
<b>COURSE TITLE</b>		<b>Fluid Mechanics</b>					
<b>COURSE OUTCOME NO</b>		<b>COURSE OUTCOME STATEMENTS</b>					
<b>C213.1</b>		Able to understand the basics of fluid properties, statics, dynamics, kinematics, concept of boundary layer in fluid flow as well as CFD					
<b>C213.2</b>		Able to explain the principle of buoyancy and flotation, laminar and turbulent flow, flow across body and checking dimensional homogeneity					
<b>C213.3</b>		Able to calculate the key fluid properties, meta centric height, lift, drag and applying Bernoulli's equation to devices					
<b>C213.4</b>							
<b>C213.5</b>							
<b>DEPARTMENT</b>	<b>ME</b>	<b>SEMESTER</b>	<b>4</b>	<b>COURSE CODE</b>	<b>18ME44</b>	<b>COURSE ID</b>	<b>C214</b>
<b>COURSE TITLE</b>		<b>Kinematics of Machines</b>					
<b>COURSE OUTCOME NO</b>		<b>COURSE OUTCOME STATEMENTS</b>					
<b>C214.1</b>		Able to illustrate the terminology of mechanisms					
<b>C214.2</b>		Able to identify the degrees of freedom and motion characteristics of planar mechanisms.					
<b>C214.3</b>		Able to predict the motion of planar mechanisms graphically and mathematically.					
<b>C214.4</b>		Able to describe the characteristics of motion in gears with involute profile					
<b>C214.5</b>		Able to calculate the velocity ratio or number of teeth for an epicyclic gear train drive.					
<b>C214.6</b>		Able to draw the profile of the cam for a desired follower motion.					
<b>DEPARTMENT</b>	<b>ME</b>	<b>SEMESTER</b>	<b>4</b>	<b>COURSE CODE</b>	<b>18ME45</b>	<b>COURSE ID</b>	<b>C215</b>
<b>COURSE TITLE</b>		<b>Metal Casting and Welding</b>					
<b>COURSE OUTCOME NO</b>		<b>COURSE OUTCOME STATEMENTS</b>					

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<b>C215.1</b>		Able to gain Knowledge about casting, welding, soldering brazing process and solidification					
<b>C215.2</b>		Able to describe molds, castings, welding, solidification process, inspection methods and furnaces. Also describe soldering, brazing methodologies.					
<b>C215.3</b>		Able to apply different casting, joining and inspection methods depending on requirement.					
<b>C215.4</b>							
<b>C215.5</b>							
<b>DEPARTMENT</b>	<b>ME</b>	<b>SEMESTER</b>	<b>4</b>	<b>COURSE CODE</b>	<b>18ME46B</b>	<b>COURSE ID</b>	<b>C216</b>
<b>COURSE TITLE</b>		<b>Mechanical Measurements and Metrology</b>					
<b>COURSE OUTCOME NO</b>		<b>COURSE OUTCOME STATEMENTS</b>					
<b>C216.1</b>		Define terms associated to metrology, measurements, measuring equipment's.					
<b>C216.2</b>		Explain different measuring instruments and their utilization.					
<b>C216.3</b>		Illustrate the measurement of force, torque, pressure, strain, temperature , screw and gear profile.					
<b>C216.4</b>							
<b>C216.5</b>							
<b>DEPARTMENT</b>	<b>ME</b>	<b>SEMESTER</b>	<b>4</b>	<b>COURSE CODE</b>	<b>18MEL47B</b>	<b>COURSE ID</b>	<b>C217</b>
<b>COURSE TITLE</b>		<b>Mechanical Measurements and Metrology Lab</b>					
<b>COURSE OUTCOME NO</b>		<b>COURSE OUTCOME STATEMENTS</b>					
<b>C217.1</b>		Able to gain knowledge on how to use different metrology measuring instruments					
<b>C217.2</b>		Able to understand and demonstrate different measuring instruments					
<b>C217.3</b>		Able to illustrate the measurement of force, torque, pressure, strain, temperature, screw and gear profile etc.,					
<b>C217.4</b>							
<b>C217.5</b>							
<b>DEPARTMENT</b>	<b>ME</b>	<b>SEMESTER</b>	<b>4</b>	<b>COURSE CODE</b>	<b>18MEL48A</b>	<b>COURSE ID</b>	<b>C218</b>
<b>COURSE TITLE</b>		<b>Foundry and Forging Lab</b>					
<b>COURSE OUTCOME NO</b>		<b>COURSE OUTCOME STATEMENTS</b>					



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<b>C218.1</b>	Able to have the Knowledge on the preparation of foundry sand and its testing, understanding on basic foundry and forging operations along with the tools involved in each of the process
<b>C218.2</b>	Able to describe different parameters involved in sand moulding, identify the importance of sand testing and its effects on the final quality of the mould.
<b>C218.3</b>	Able to perform basic foundry and forging operations to obtain the desired shapes and with the prescribed quality.
<b>C218.4</b>	Able to compare and Analyse the effect of sand and its composition on the strength of the mould using various testing procedures.
<b>C218.5</b>	

3<sup>RD</sup> YEAR

<b>DEPARTMENT</b>	<b>ME</b>	<b>SEMESTER</b>	<b>5</b>	<b>COURSE CODE</b>	<b>17ME51</b>	<b>COURSE ID</b>	<b>C301</b>
<b>COURSE TITLE</b>		<b>MANAGEMENT AND ENGINEERING ECONOMICS</b>					
<b>COURSE OUTCOME NO</b>		<b>COURSE OUTCOME STATEMENTS</b>					
<b>C301.1</b>		Understand needs, functions, roles, scope and evolution of Management; Importance, purpose of Planning and hierarchy of planning and also analyze its types.					
<b>C301.2</b>		Understanding of why economics is important to engineers, basic interest calculations.					
<b>C301.3</b>		Discuss Decision making, Organizing, Staffing, Directing and Controlling					
<b>C301.4</b>		How to arrive at the Selling Price of a component, cost components involved in manufacturing product.					
<b>C301.5</b>		To evaluate assests/ projects and choose alternatives based on the investment today					
<b>DEPARTMENT</b>	<b>ME</b>	<b>SEMESTER</b>	<b>5</b>	<b>COURSE CODE</b>	<b>17ME52</b>	<b>COURSE ID</b>	<b>C302</b>
<b>COURSE TITLE</b>		<b>DYNAMICS OF MACHINERY</b>					
<b>COURSE OUTCOME NO</b>		<b>COURSE OUTCOME STATEMENTS</b>					
<b>C302.1</b>		Describe motion, static and dynamic equilibrium conditions for different mechanisms and machine elements.					
<b>C302.2</b>		Understand force transmission and balancing in different mechanisms and also principles of vibrations of single degree of freedom mechanical systems					
<b>C302.3</b>		Solve problems on force transmission and balancing in different mechanisms and vibration characteristics of single					

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		degree of freedom mechanical systems.					
<b>C302.4</b>		Explain force transmission and vibration characteristics in different mechanical systems.					
<b>C302.5</b>							
<b>DEPARTMENT</b>	<b>ME</b>	<b>SEMESTER</b>	<b>5</b>	<b>COURSE CODE</b>	<b>17ME53</b>	<b>COURSE ID</b>	<b>C303</b>
<b>COURSE TITLE</b>		<b>TURBO MACHINES</b>					
<b>COURSE OUTCOME NO</b>		<b>COURSE OUTCOME STATEMENTS</b>					
<b>C303.1</b>		Able to define basic definitions of turbomachines and sketching of velocity triangles for different flow turbomachines.					
<b>C303.2</b>		Able to derive or Obtain expressions for different flow type turbomachines during energy transfer.					
<b>C303.3</b>		Able to apply the derived equations and knowledge of turbomachines in solving numerical problems					
<b>C303.4</b>							
<b>C303.5</b>							
<b>DEPARTMENT</b>	<b>ME</b>	<b>SEMESTER</b>	<b>5</b>	<b>COURSE CODE</b>	<b>17ME54</b>	<b>COURSE ID</b>	<b>C304</b>
<b>COURSE TITLE</b>		<b>DESIGN OF MACHINE ELEMENTS-</b>					
<b>COURSE OUTCOME NO</b>		<b>COURSE OUTCOME STATEMENTS</b>					
<b>C304.1</b>		Understand basic of Mechanical Design procedure, material properties and selection of material, codes and standards.					
<b>C304.2</b>		Design machine components for static, impact and fatigue strength.					
<b>C304.3</b>		Design fasteners, shafts, keys, couplings, riveted and welded joints,					
<b>C304.4</b>		Analyze the stress level and deformation in the different parts of the machine components, to determine the dimensions of the component.					
<b>C304.5</b>							
<b>DEPARTMENT</b>	<b>ME</b>	<b>SEMESTER</b>	<b>5</b>	<b>COURSE CODE</b>	<b>17ME554</b>	<b>COURSE ID</b>	<b>C305</b>
<b>COURSE TITLE</b>		<b>NON TRADITIONAL MACHINING</b>					
<b>COURSE OUTCOME NO</b>		<b>COURSE OUTCOME STATEMENTS</b>					
<b>C305.1</b>		To understand the importance and different types of non-traditional machining methods.					
<b>C305.2</b>		Able to explain principle and procedure of various NTM processes					
<b>C305.3</b>		Illustrate the process parameters, limitations, advantages and applications of different NTM processes.					
<b>C305.4</b>							
<b>C305.5</b>							



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DEPARTMENT	ME	SEMESTER	5	COURSE CODE	17ME563	COURSE ID	C306
COURSE TITLE		AUTOMATION AND ROBOTICS					
COURSE OUTCOME NO		COURSE OUTCOME STATEMENTS					
C306.1		To identify potential areas for automation and justify need for automation.					
C306.2		To select suitable major control components required to automate a process or an activity.					
C306.3		To study the various parts of robots and fields of robotics.					
C306.4		To study the various kinematics and inverse kinematics of robots.					
C306.5		To study the control of robots for some specific applications.					
DEPARTMENT	ME	SEMESTER	5	COURSE CODE	17ME57	COURSE ID	C307
COURSE TITLE		FLUID MECHANICS AND MACHINERY LAB					
COURSE OUTCOME NO		COURSE OUTCOME STATEMENTS					
C307.1		Able to define fluid mechanics, fluid and their properties					
C307.2		Able to obtain or derive mathematical relation and conduct the experiment					
C307.3		Able to calculate the efficiency and discharge by the machineries					
C307.4							
C307.5							
DEPARTMENT	ME	SEMESTER	5	COURSE CODE	17ME58	COURSE ID	C308
COURSE TITLE		ENERGY LAB					
COURSE OUTCOME NO		COURSE OUTCOME STATEMENTS					
C308.1		Able to define basic terms and performance parameters of IC engines					
C308.2		Able to write the Procedure of working of various IC engine equipments and measuring apparatus					
C308.3		Able to calculate the performance parameters of IC engines, properties of fuel and lubricating oils					
C308.4							
C308.5							

DEPARTMENT	ME	SEMESTER	6	COURSE CODE	17ME61	COURSE ID	C311
COURSE TITLE		Finite Element Analysis					
COURSE OUTCOME NO		COURSE OUTCOME STATEMENTS					
C311.1		Able to know the principles of energy methods, stress					



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		conditions and finite element method.					
<b>C311.2</b>		Able to Derive shape functions & stiffness matrices for different finite elements.					
<b>C311.3</b>		Able to obtain Stiffness matrix and Load vector of bar, Truss, Beams, Conduction elements					
<b>C311.4</b>		Able to solve problems on Bar, Truss, Beams, Heat Transfer, Numerical Integration					
<b>C311.5</b>							
<b>DEPARTMENT</b>	<b>ME</b>	<b>SEMESTER</b>	<b>6</b>	<b>COURSE CODE</b>	<b>17ME62</b>	<b>COURSE ID</b>	<b>C312</b>
<b>COURSE TITLE</b>		<b>Computer integrated Manufacturing</b>					
<b>COURSE OUTCOME NO</b>		<b>COURSE OUTCOME STATEMENTS</b>					
<b>C312.1</b>		Able to define Automation, CIM, CAD, CAM, CNC, CNC program, Robotic systems, Additive manufacturing, Industry 4.0 and IOT.					
<b>C312.2</b>		Able to explain the basics of automated manufacturing industries through mathematical models and categorize different types of automated flow lines, robotic systems, additive manufacturing techniques.					
<b>C312.3</b>		Able to execute programs for various manufacturing processes and robot programming.					
<b>C312.4</b>		Able to analyze the automated flow lines to reduce time and enhance productivity					
<b>C312.5</b>		Able to visualize and appreciate the modern trends in Manufacturing like additive manufacturing, Industry 4.0 and applications of Internet of Things leading to Smart Manufacturing.					
<b>DEPARTMENT</b>	<b>ME</b>	<b>SEMESTER</b>	<b>6</b>	<b>COURSE CODE</b>	<b>17ME63</b>	<b>COURSE ID</b>	<b>C313</b>
<b>COURSE TITLE</b>		<b>Heat Transfer</b>					
<b>COURSE OUTCOME NO</b>		<b>COURSE OUTCOME STATEMENTS</b>					
<b>C313.1</b>		Able to state the different modes of Heat Transfer					
<b>C313.2</b>		Able to derive the laws from the modes in Heat Transfer					
<b>C313.3</b>		Able to draw/ Apply the heat flow rate and effectiveness of conduction, convection and radiation heat transfer					
<b>C313.4</b>							
<b>C313.5</b>							
<b>DEPARTMENT</b>	<b>ME</b>	<b>SEMESTER</b>	<b>6</b>	<b>COURSE CODE</b>	<b>17ME64</b>	<b>COURSE ID</b>	<b>C314</b>
<b>COURSE TITLE</b>		<b>Design of Machine Elements -II</b>					
<b>COURSE OUTCOME NO</b>		<b>COURSE OUTCOME STATEMENTS</b>					
<b>C314.1</b>		Able to define stresses in curved beams and springs					
<b>C314.2</b>		Able to select the flexible (belt, rope and chain) drives and gears.					
<b>C314.3</b>		Able to explain the stresses in curved beams, springs, power					



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		transmitting elements and IC engine parts.					
<b>C314.4</b>		Able to determine the stresses in curved beams, springs and gears.					
<b>C314.5</b>		Able to calculate the flexible drive sizes, breaks, clutch, bearings and IC engine parts					
<b>DEPARTMENT</b>	<b>ME</b>	<b>SEMESTER</b>	<b>6</b>	<b>COURSE CODE</b>	<b>17ME655</b>	<b>COURSE ID</b>	<b>C315</b>
<b>COURSE TITLE</b>	<b>Automobile Engineering</b>						
<b>COURSE OUTCOME NO</b>	<b>COURSE OUTCOME STATEMENTS</b>						
<b>C315.1</b>	Identifying different parts of an automobile and it's working						
<b>C315.2</b>	Understand the working of transmission and braking systems						
<b>C315.3</b>	Comprehend the working of steering and suspension systems						
<b>C315.4</b>	Learn various types of fuels and injection systems						
<b>C315.5</b>	Know the cause of automobile emissions, its effects on environment and methods to reduce the emissions.						
<b>DEPARTMENT</b>	<b>ME</b>	<b>SEMESTER</b>	<b>6</b>	<b>COURSE CODE</b>	<b>17ME664</b>	<b>COURSE ID</b>	<b>C316</b>
<b>COURSE TITLE</b>	<b>Total Quality Management</b>						
<b>COURSE OUTCOME NO</b>	<b>COURSE OUTCOME STATEMENTS</b>						
<b>C316.1</b>	Able to identify and demonstrate the principles of TQM, Quality Gurus, Leadership and Customer Satisfaction.						
<b>C316.2</b>	Able to describe the tools used in Quality Management						
<b>C316.3</b>	Able to apply the concept of Six Sigma and Statistical Process Control. Construct the Control Charts, Interpret the type of data and evaluate.						
<b>C316.4</b>							
<b>C316.5</b>							
<b>DEPARTMENT</b>	<b>ME</b>	<b>SEMESTER</b>	<b>6</b>	<b>COURSE CODE</b>	<b>17MEL67</b>	<b>COURSE ID</b>	<b>C317</b>
<b>COURSE TITLE</b>	<b>Heat Transfer Lab</b>						
<b>COURSE OUTCOME NO</b>	<b>COURSE OUTCOME STATEMENTS</b>						
<b>C317.1</b>	Able to define basic terms and modes of heat transfer						
<b>C317.2</b>	Able to write the Procedure of working of various heat transfer equipments as well as refrigeration and Air conditioning system.						
<b>C317.3</b>	Able to calculate the heat transfer rate, heat transfer coefficients and performance of RAC by conducting experiments, also temperature distribution of steady and transient heat conduction using numerical approach.						
<b>C317.4</b>							
<b>C317.5</b>							
<b>DEPARTMENT</b>	<b>ME</b>	<b>SEMESTER</b>	<b>6</b>	<b>COURSE CODE</b>	<b>17MEL68</b>	<b>COURSE ID</b>	<b>C318</b>

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<b>COURSE TITLE</b>	<b>Modelling and Analysis Lab</b>
<b>COURSE OUTCOME NO</b>	<b>COURSE OUTCOME STATEMENTS</b>
<b>C318.1</b>	Able to finite Element Analysis & Applications
<b>C318.2</b>	Able to comprehend natural frequency, Damping of single degree of vibrating systems, critical speed of shafts, pressure distribution in journal bearing
<b>C318.3</b>	Able to calculate and interpret stress and strains using strain gauges, photo elastic compression and bending To orient and balance masses rotating in different planes.
<b>C318.4</b>	Able to analyse stress concentration in rectangular plate with hole and to analyse governor equilibrium speed, sensitivity and power.
<b>C318.5</b>	

4<sup>TH</sup> YEAR

DEPARTMENT	ME	SEMESTER	7	COURSE CODE	15ME71	COURSE ID	C401
COURSE TITLE		ENERGY ENGINEERING					
COURSE OUTCOME NO		COURSE OUTCOME STATEMENTS					
C401.1		Able to Enable to comprehend the knowledge of fundamentals.					
C401.2		Able to understand various parameters related to the power plants.					
C401.3		Able to understand the mathematical relationship with respect to Economic Analysis of power plants.					
C401.4							
C401.5							
DEPARTMENT	ME	SEMESTER	7	COURSE CODE	15ME72	COURSE ID	C402
COURSE TITLE		FLUID POWER SYSTEMS					
COURSE OUTCOME NO		COURSE OUTCOME STATEMENTS					
C402.1		Enables to understand the Principle and components of Hydraulic and Pneumatic system.					
C402.2		Enables to understand the working of Hydraulics pumps and motors, able to calculate performance of Pumps and motors.					
C402.3		Understand Hydraulic and Pneumatic control components and their graphic symbols.					
C402.4		Able to design Hydraulic/Pneumatic Circuits. Understand basic fluid power maintenance procedures.					
C402.5		Understand the usage of logic gates & multi cylinder applications.					

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DEPARTMENT	ME	SEMESTER	7	COURSE CODE	15ME73	COURSE ID	C403
COURSE TITLE		CONTROL ENGINEERING					
COURSE OUTCOME NO		COURSE OUTCOME STATEMENTS					
C403.1		Able to recognize control system and its types , control actions.					
C403.2		Able to determine the system governing equations for physical models (Electrical, Thermal, Mechanical, Electro Mechanical).					
C403.3		Able to calculate the gain of the system using block diagram and signal flow graph					
C403.4		Able to illustrate the response of 1st and 2nd order systems.					
C403.5		Able to determine the stability of transfer functions in complex domain and frequency domain.					
C403.6		Able to employ state equations to study the controllability and observability					
DEPARTMENT	ME	SEMESTER	7	COURSE CODE	15ME745	COURSE ID	C404
COURSE TITLE		SMART MATERIALS AND MEMS					
COURSE OUTCOME NO		COURSE OUTCOME STATEMENTS					
C404.1		Identify the smart structures, vibration absorbers and MEMS.					
C404.2		Summarize the properties of shape memory alloy, rheological fluids and optical fibers.					
C404.3		Describe the sensor and actuator devices and characterize the smart structure.					
C404.4		Carryout the case studies of MEMS for performance and reliability accounting					
C404.5							
DEPARTMENT	ME	SEMESTER	7	COURSE CODE	15ME751	COURSE ID	C405
COURSE TITLE		AUTOMOTIVE ELECTRONICS					
COURSE OUTCOME NO		COURSE OUTCOME STATEMENTS					
C405.1		Recall the basic concepts and electronic systems used in automobiles					
C405.2		Summarize different technological advances in automobiles including diagnostics of systems and sub systems.					
C405.3		Select sensors, actuators and control systems for different applications in automobiles					
C405.4							
C405.5							
DEPARTMENT	ME	SEMESTER	7	COURSE CODE	15MEL76	COURSE ID	C406
COURSE TITLE		DESIGN LAB					
COURSE OUTCOME NO		COURSE OUTCOME STATEMENTS					



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<b>C406.1</b>		Able to identify the longitudinal and Torsional single degree of vibrating systems, also to identify different types of Governors, Gyroscope.					
<b>C406.2</b>		Able to comprehend natural frequency, Damping of single degree of vibrating systems, critical speed of shafts, pressure distribution in journal bearing					
<b>C406.3</b>		Able to calculate and interpret stress and strains using strain gauges, photo elastic compression and bending and to orient and balance masses rotating in different planes.					
<b>C406.4</b>		Able to analyse stress concentration in rectangular plate with hole and to analyse governor equilibrium speed, sensitivity and power.					
<b>C406.5</b>							
<b>DEPARTMENT</b>	<b>ME</b>	<b>SEMESTER</b>	<b>7</b>	<b>COURSE CODE</b>	<b>15MEL77</b>	<b>COURSE ID</b>	<b>C407</b>
<b>COURSE TITLE</b>		<b>CIM LAB</b>					
<b>COURSE OUTCOME NO</b>		<b>COURSE OUTCOME STATEMENTS</b>					
<b>C407.1</b>		Able to write CNC part programs using CADEM simulation package for simulation of machining operations such as Turning, Drilling & Milling.					
<b>C407.2</b>		Able to understand write programs for Flexible Manufacturing Systems Robotics					
<b>C407.3</b>		Able to understand the operating principles of hydraulics, pneumatics and electro– pneumatic systems.					
<b>C407.4</b>							
<b>C407.5</b>							

<b>DEPARTMENT</b>	<b>ME</b>	<b>SEMESTER</b>	<b>8</b>	<b>COURSE CODE</b>	<b>15ME81</b>	<b>COURSE ID</b>	<b>C411</b>
<b>COURSE TITLE</b>		<b>Operations Research</b>					
<b>COURSE OUTCOME NO</b>		<b>COURSE OUTCOME STATEMENTS</b>					
<b>C411.1</b>		Able to define terminologies and procedures associated with different Operations Research techniques.					
<b>C411.2</b>		Able to describe the importance, Characteristics and limitations of OR techniques					
<b>C411.3</b>		Able to apply OR technique/strategies to solve industrial and managerial related problems.					
<b>C411.4</b>		Able to allocate and schedule the resources and optimum cost and time.					
<b>C411.5</b>		Able to review and evaluate project duration and Critical path.					



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DEPARTMENT	ME	SEMESTER	8	COURSE CODE	15ME82	COURSE ID	C412
COURSE TITLE		Additive manufacturing					
COURSE OUTCOME NO		COURSE OUTCOME STATEMENTS					
C412.1		Understand the different process of Additive Manufacturing. using Polymer, Powder and Nano materials manufacturing.					
C412.2		Analyse the different characterization techniques					
C412.3		Describe the various NC, CNC machine programing and Automation techniques					
C412.4							
C412.5							
DEPARTMENT	ME	SEMESTER	8	COURSE CODE	15ME835	COURSE ID	C413
COURSE TITLE		PRODUCT LIFE CYCLE MANAGEMENT					
COURSE OUTCOME NO		COURSE OUTCOME STATEMENTS					
C413.1		Explain the various strategies involved in Product Life Cycle Management and Product Data Management					
C413.2		Carry out the decomposition and model simulation in product design					
C413.3		Implement structuring in new product development process.					
C413.4		Select the tools needed to forecast the technology innovation.					
C413.5		Carry out product structuring using virtual product development tools					